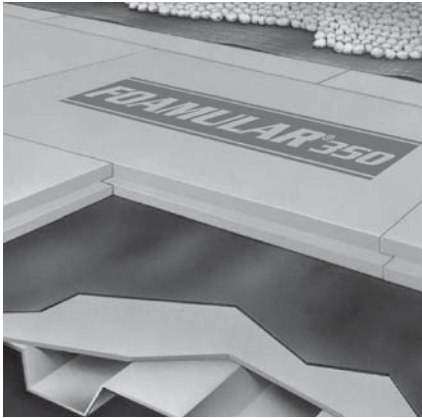




INNOVATIONS FOR LIVING®

07 22 16.13.OCC Rigid Extruded Polystyrene Insulation for Protected Membrane Roofing Foamular® 350 and Foamular® 350 CVI

Product Data Sheet



PRODUCT DESCRIPTION

High density rigid extruded PINK™ polystyrene thermal insulating boards. Two types of rigid extruded polystyrene insulating panels are available in standard board sizes (610 mm x 1220 mm ; 24 in. x 48 in.), and various thicknesses (51 mm to 100 mm ; 2 in. to 4 in.) for the FOAMULAR® 350 and (51 mm to 100 mm ; 2 in. to 4 in.) for the FOAMULAR® 350 CVI, with shiplapped edges, helping reduce air and water infiltrations.

FOAMULAR® 350 and FOAMULAR® 350 CVI boards have exceptional thermal resistance (RSI 0.88/25 mm; R-5/inch), compressive strength (240 kPa ; 35 lbs/ft²) and hydrophobic properties (0.7% water absorption). These properties make it an excellent choice to maintain constant roof membrane temperatures and protect it from the damaging effects of freeze-thaw cycles, aging, and damage caused by weather and U.V. rays as well as physical damages that may arise during and after construction.

Owens Corning developed the FOAMULAR® 350 CVI board with drainage channels on the underside and around the entire perimeter. Compared to a standard board, the CVI board has the additional advantage

of facilitating the flow of water infiltrated under the insulating boards to the waterproofing system's surface and drains. This reduces the risk of stagnating water, notably at the following locations: on a low slope roof, around controlled flow roof drains, or because of blockages caused by construction debris left in place following a roof replacement.

The FOAMULAR® 350 CVI board diminishes the boards' tendency to float, the risk of their displacement and, consequently, the opening of the joints when a single board thickness is used. Finally, drainage channels can help dry the membrane and improve the waterproofing systems' performance.

The dimensions and locations of the channels on the back of the FOAMULAR® 350 CVI boards are as follows : (refer to drawing #F350 CVI E1)

- One (1) lengthwise and two (2) widthwise : 13 mm wide x 13 mm deep max; ½ in. x ½ in.
- One (1) on the entire perimeter : 6.5 mm wide x 13 mm deep max; ¼ in. x ½ in.

FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene boards are produced using a blowing agent containing no CFC nor HCFC, meeting or exceeding government environmental requirements (Montreal Protocol).

Recommended Uses

Use FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene insulation boards for new as well as existing roofs, particularly to improve their thermal resistance and the repair of old or damaged roofs.

The insulation boards may be installed on most waterproofing membrane types, including modified bituminous, hot applied liquid rubber, thermoplastic, and EPDM membranes. Insulation

boards are an essential part in the construction of roofs, terraces, and garden roofs supported by deck covering fastened to the steel deck and serving as a fire resistant thermal barrier or on a concrete roof deck.

FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene boards are certified GREENGUARD and SCS (see technical data); consequently, their use can contribute to obtain LEED® Certification credits in a building submitted to the LEED® Canada NC 2009 (refer to TABLE 2).

Limitations

OWENS CORNING CANADA LP does not recommend using FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene boards in the following locations:

FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene boards are combustible products and their use is prohibited :

- When in contact with surfaces whose temperature may exceed 65° C (150° F) or in locations where ambient temperature will constantly exceed 74° C (165° F).
- Where it is impossible to provide clearances required by Codes and regulations (building, electrical, gas and oil) between the extruded polystyrene insulation and heat emitting appliances, chimneys, pipes, conduits and vents to these appliances and between insulation and recessed light fixtures which are not encased in CSA approved insulated boxes.

Other precautions to be taken:

- Protect polystyrene boards from prolonged exposure to sunlight which may cause surface discoloration and/or deterioration; cover with filter fabric as soon as insulation is completed; keep boards in storage and in its packaging until



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time of installation.

- Before using adhesives, sealants or other similar products with polystyrene boards, verify their compatibility with manufacturers.

Components

Polystyrene insulation fabricated of crystalline polystyrene resin expanded and extruded into rigid boards.

Recycled materials incorporated into polystyrene board fabrication are obtained from the following source:

- "Post-industrial" (or "pre-consumer") source: materials recycled from industry wide manufacturing waste that can be recycled to fabricate polystyrene boards.

TECHNICAL DATA

Applicable Codes and Standards

National Building Code of Canada or provincial Code in force

Canadian Standards (Underwriters Laboratories of Canada (ULC))

- CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
- CAN/ULC-S102.2, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies;

Canadian General Standards Board (CGSB)

- CGSB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation.

Canadian General Standards Board (CGSB)

- ASTM C177, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.

- ASTM C203, Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
- ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
- ASTM D696, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer

American Standards

- ASTM D1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
- ASTM D 2126, Standard Test Method for Response of Rigid

Cellular Plastics to Thermal and Humid Aging

- ASTM D2842, Standard Test Method for Water Absorption of Rigid Cellular Plastics
- ASTM D2863, Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index).
- ASTM E96, Test Methods for Water Vapour Transmission of Materials.

Health Canada/Workplace Hazardous Materials Information System (WHMIS) Consult the Internet site www.owenscorning.ca to obtain an up-to-date material safety data sheet (MSDS) for FOAMULAR® high density rigid extruded polystyrene insulation.

TABLE I Physical Properties

Properties	Test Method	FOAMULAR® 350 / FOAMULAR® 350 CVI (CAN/ULC-S701, Type 4)
THERMAL RESISTANCE ⁽¹⁾ R value (ft ² hr °F/BTU) RSI value (m ² °C/W)	C518 or C517	5.0 0.88
COMPRESSIVE STRENGTH, min. ⁽²⁾ (psi) (kPa)	D 1621	35 240
WATER ABSORPTION (maximum % by volume)	D 2842	0.70
WATER VAPOUR PERMEANCE, max. (Perm) (ng/Pa.s.m ²)	E 96	0.60 35
WATER CAPILLARITY	_____	Nil
WATER AFFINITY	_____	Hydrophobic
FLEXURAL STRENGTH, typical (psi) (kPa)	C 203	60 415
LINEAR COEFFICIENT OF THERMAL EXPANSION (in/in/°F) (mm/m/°C)	D 696	2.7 × 10 ⁻⁵ 4.9 × 10 ⁻⁵
DIMENSIONAL STABILITY, max. (% of linear change)	D 2126	1.5
LIMITING OXYGEN INDEX (min %) (% linear change)	D2863	24
MAXIMUM SERVICE TEMPERATURE (°F) (°C)	_____	165 °F 74 °C

⁽¹⁾ Thermal resistance per inch thickness (25 mm).

⁽²⁾ at 10% deformation or yield

Registry of Product Information of the Canadian Construction Materials Center (CCMC)

FOAMULAR® 350 and FOAMULAR® 350 CVI insulation boards meet requirements of CAN/ULC-S701, Type 4 and their product data sheets have the CCMC registry number **CCMC 13430-L**



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Environmental Standards Compliance

- **Meets the Montreal Protocol regulations (CFC and HCFC free)**
- **Zero ozone depletion**
- **70% lower global warming potential**

Certification by independent third party agencies – standards pertaining to recycled materials content and indoor air quality.

SCS Certification (Scientific Certification Systems) for recycled materials content.

Certification based on Environmental Claims Certification Program:

- 20% minimum certified recycled materials content distributed as follows: 20% "post-industrial" (or "pre-consumer") average recycled polystyrene materials content for the following products fabricated in Owens Corning manufacturing facilities: Rigid polystyrene insulation: FOAMULAR® brand, (Valleyfield, Québec, in Canada and Rockford, Illinois, Tallmadge, Ohio and Gresham, Oregon in the United States).

Consult the Internet site www.scs-certified.com to obtain a current copy of the « Certificate of Achievement »: « manufactured by Owens Corning (various forms and sizes) ». FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene insulation boards are certified by Greenguard to meet rigorous indoor air quality standards.

Certification based on the GREENGUARD Product Emission Standard for Children & Schools:

- VOCs < 1/100 TLV and < ½ CA chronic REL
- Formaldehyde < 0.0135 ppm⁽¹⁾ / 13.5 ppb
- Total VOCs < 0.22 mg/m³

- Total Aldehydes < 0.043 ppm/43 ppb
- Respirable Particles < 0.01 mg/m³
- Total Particles < 0.02 mg/m³ (< 10µm)

⁽¹⁾ The 0.1 ppm rate recommended by Health Canada is greater than that certified by GREENGUARD. «GREENGUARD Indoor Air Quality Certified» certification: Owens Corning FOAMULAR® Rigid Extruded Polystyrene Insulation. Consult the Internet site www.greenguard.org to obtain a current copy of the Certificate.

IDENTIFICATION AND FORMATS

Product Identification

Each board must be adequately labeled or marked to indicate the following information:

- A. CAN/ULC-S701-Type 4
- B. Board Type

C. Name of the manufacturer or brand name

D. CCMC Product Evaluation Number

E. a cautionary statement as follows:

Caution: COMBUSTIBLE PRODUCT. KEEP AWAY FROM HEAT, SPARKS AND FLAMES. THIS PRODUCT IS COMBUSTIBLE AND CAN INFLAME ITSELF WHEN EXPOSED TO A SUFFICIENTLY INTENSE HEAT SOURCE. PROTECTION OR THERMAL BARRIER IS REQUIRED IN ACCORDANCE WITH APPLICABLE BUILDING CODE.

Sizes, weights and packaging

FOAMULAR® 350 standard sizes : 610 mm x 1220 mm (24 in. x 48 in.) x 51 mm, 76 mm and 102 mm thickness (2 in., 3 in. and 4 in. thickness).

FOAMULAR® 350 CVI standard sizes :

CONTRIBUTION TO LEED CANADA CERTIFICATION

TABLE 2: Contribution of FOAMULAR® 350 AND FOAMULAR® 350 CVI rigid extruded polystyrene insulation boards manufactured by Owens Corning towards LEED® credits⁽¹⁾

Category and performance criteria	Requirements to meet to obtain a voluntary credit	Insulation's contribution to the performance	Additional comments
EA (Energy and Atmosphere) Credit 1 for energy performance optimization of new or existing buildings.	Anticipated energy cost reduction compared to MNECB® or ASHRAE 90.1-2007: 1-19 points for NC, 3 to 21 points for CS, based on % reduction.	Insulation contributes significantly to the reduction of a building's energy demand. Global contribution depends on the design RSI value.	The Project Manager is responsible for the energy analysis concerning the global energy efficiency of the building (ex. LEED standard form letter).
MR (Materials and Resources) Credit 4 for recycled materials content. ⁽²⁾	"Post-consumer" recycled content plus one half "post-industrial" recycled materials: 1 point for at least 10% and 2 points for at least 20%.	FOAMULAR® 350 and FOAMULAR® 350 CVI (Rockford, Illinois, Tallmadge, Ohio and Gresham, Oregon in the United States, and Valleyfield, Québec in Canada) +20% p-i and 0% p-c.	SCS (Scientific Certification Systems) certification for recycled materials content for FOAMULAR® 350 and FOAMULAR® 350 CVI rigid extruded polystyrene insulation boards (North-American average of 20%).
MR (Materials and Resources) Credits 5. for locally or regionally produced materials.	Use building materials/ products extracted, harvested, recovered & processed within 800 km (2,400 km if shipped by rail or water) of the final manufacturing site. Demonstrate final manufacturing site is within 800 km (2,400 km if shipped by rail or water) of project site for these products: 1 point for at least 20% and 2 points for at least 30%.	All extruded polystyrene insulation boards are manufactured in Valleyfield, Québec in Canada and in Rockford, Illinois, Tallmadge, Ohio and Gresham, Oregon in the United States. They can contribute towards credit(s) for this category	Verify with local sales representatives to determine the product's origin.

⁽¹⁾ Refer to the LEED® Canada for new construction and major renovations 2009, as promoted by the CaGBC.

⁽²⁾ Model National Energy Code for Buildings 1997.

⁽³⁾ The recycled content of a material or furniture must be determined by dividing the weight of the recycled content of the item by the total weight of the whole item, then by multiplying the resulting ratio by the total cost of the item.



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610 mm x 1220 mm (24 in. x 48 in. x 51 mm, 76 mm and 102 mm thickness (2 in., 3 in. and 4 in. thickness).

Packaging: shipped in units containing four (4) shrink-wrapped 610 mm (2 ft) wide x 610 mm (2 ft) high x 2438 mm (8 ft) long packages and measuring 1220 mm (4 ft) wide x 1220 mm (4 ft) high x 2438 mm (8 ft) long.

Shiplapped edges only in standard board sizes.

APPLICATION

Safety measures: Applicator protection

This product is combustible and may constitute a fire risk if not used or installed properly. Although it contains a fire-suppressing agent, the product will ignite if exposed to a sufficiently intense flame. Do not expose to open flames or any other ignition source during transport, handling, storage or use.

Preparation

Ensure surfaces to be covered with insulation boards have been inspected, notably:

- All steel and concrete decks have the minimum slope as required by the Building Code or in accordance with CRCA performance specifications.
- Support is solid, level, uniform, dry and free of snow, ice, frost, dust, debris and any other contaminant.
- Parapets and expansion and control joint curbs are built.

- Roof drains have been installed at the appropriate level in relation with the finished surface.
- Sleeves, pipes and other penetrations through the support are correctly installed.

Installation

Carefully place and adjust FOAMULAR® 350 or FOAMULAR® 350 CVI insulation boards on the roof membrane to obtain tight joints or lapped when two thicknesses of insulation. Make tight joints between each board and around roof drains, air ducts and framing passing through; where two layers are required, overlap all joints.

Once insulation boards are installed, cover completely with a filter fabric and ballast (gravel, topsoil, prefabricated pavers or others) having the required weight.

AVAILABILITY AND COST

Cost Estimates

Cost estimates are readily available from a physical description consisting of drawings and a brief specification based on the information contained in this product data sheet.

For more information on product availability or costs, contact your regional technical representative.

TECHNICAL SERVICES

OWENS CORNING CANADA LP publishes many technical bulletins and

offers in-depth consultation services and dew point analysis to help you select products, prepare details and write specifications. For more information, contact your regional technical representative.

QUALITY CONTROL

OWENS CORNING CANADA LP regularly submits its products to independent agencies that certify their environmental quality in terms of:

- Noxious chemical and volatile particle emissions affecting indoor air quality and the ozone layer
- Recycled materials content

INFORMATION CLASSIFICATION SYSTEM

Architectural Specifications

Classification in accordance with Master Format 2004 (level 4) published by CSC-DCC and CSI. Selected number and title are

07 22 16.13 – Rigid Insulation Boards for Roofing.

Data Sheet

Classification in accordance with Master Format 2004 (level 5) published by CSC-DCC and CSI.

Selected number **07 22 16.13OCC** corresponds to OWENS CORNING CANADA (OCC) classification for **FOAMULAR® 350** and **FOAMULAR® 350 CVI** high density rigid extruded polystyrene insulation board.



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